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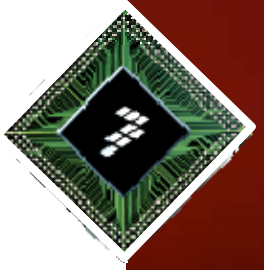
KVM on Embedded POWER
An Update

Stuart Yoder



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Agenda

- Embedded Systems & KVM
- Status
- To Do

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Embedded Systems

- How is embedded different?
  - Fixed function devices– not general purpose
  - Huge variety of hardware platforms
    - No standard platforms (no BIOS, ACPI, UEFI)
  - Real time constraints
  - Large variety of operating systems
    - VDC Research (2011 report)
      - About 50% of devices shipped by survey respondents had no formal OS or an in-house developed OS

- Virtualization capabilities that are less important:
  - Dozens or hundreds of VMs
  - Live migration

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QorIQ Processing Platforms

QorIQ P5 **P5020, P5010**	64-bit High End Up to 2.2 GHz	Service Provider Routers	Network Admission Controls	Storage Networks	Switching
QorIQ P4 **P4080, P4040**	4 – 8 Cores Up to 1.5 GHz	Metro Carrier Edge Router	IMS Controller	Radio Network Control	Serving Node Router
QorIQ P3 **P3041**	2 – 4 Cores Up to 1.5 GHz	Converged Media Gateway	SSL, IPSec, Firewall	Access Gateway	
QorIQ P2 **P2040, P2020, P2010**	1 – 2 Cores Up to 1.2 GHz	Unified Threat Mgmt	VoIP Carrier-Class Media Gateway	Wireless Media Gateway	Base Station
QorIQ P1 **P1010, P1011, P1012, P1013, P1014, P1015, P1016, P1017, P1020, P1021, P1022, P1023, P1024, P1025**	1 – 2 Cores 400 MHz to 1 GHz	Integrated Services Router	Network Attached Storage	Home Media Hub	Enterprise WAP

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Status

- e500mc (32-bit) support upstream
  - A few vcpu features still pending
- 64-bit support(e5500) implemented and nearly through review cycle
- SMP support
- Hugetlbfs support
- Generic e500 machine implemented in QEMU
  - QEMU e500 platform now in upstream Linux kernel
  - Device tree is now dynamically generated
- Cleanup / bug fixes
- Freescale IOMMU (PAMU) driver development in process

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To Do

- Performance analysis
- e6500 core support
  - LRAT: Logical-to-Real Address Translation
- QEMU gdb stub
- Device assignment / VFIO
  - Datapath Acceleration Architecture (DPAA)
- In-kernel interrupt controller (MPIC)
- Real Time
- Libvirt
- Direct interrupts to VM for pass-through devices

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